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**EUROPEAN PATENT APPLICATION**

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(72) Inventor: **Rasband, Paul Brent  
Frederick, MD 21701 (US)**

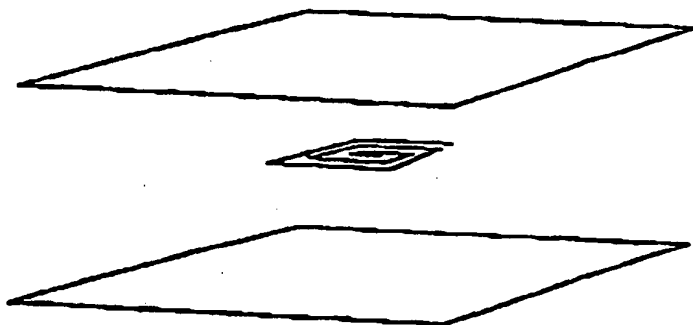
(74) Representative: **Thomson, Paul Anthony et al  
Potts, Kerr & Co.,  
15, Hamilton Square  
Birkenhead, Merseyside CH41 6BR (GB)**

(71) Applicant: **WESTVACO CORPORATION  
New York New York 10171 (US)**

(54) **EAS ready paperboard**

(57) The present invention relates to a method for combining RF-EAS circuits with paperboard for producing disposable RF-EAS security tags, or to a method for

manufacturing paperboard packaging, such as trays, lids, cartons containers or combinations with an integral RF-EAS security tag.



**FIG. 1**

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## Description

### BACKGROUND OF THE INVENTION

[0001] The present invention relates generally to a method for combining an RF-EAS circuit with paperboard. More particularly, the invention relates to such a method whereby the RF-EAS circuits are sandwiched between two webs of paperboard on a printing press or the like. The combined structure may then be converted into disposable RF-EAS security tags or into packaging blanks (e.g., trays, lids, cartons, containers, etc.), at the same time that product ID's and sales graphics are printed on the paperboard.

[0002] RF-EAS (Electronic Article Surveillance) tags are passive circuits with a resonance frequency tuned to the frequency of tag detectors located at the entrances and exits of retail establishments. When an active tag passes through a detector, an alarm sounds, alerting store employees to the potential theft of the tagged merchandise. State of the art RF-EAS tags are generally produced by a number of steps which include stamping, masking, photochemical treatments, chemical etching and printing. However, the tags currently available are too expensive to be economically used on items retailing for about \$5.00 or less. The use of currently available tags entails not only the cost of the tag itself, but the cost of application of the tag to the product or its package, either on a packaging line, in a warehouse, or in the retailer's stockroom.

[0003] Such tags may be buried beneath various layers of material without reducing their effectiveness. Obviously, the more deeply the tag is embedded in the merchandise, the more difficult it is to circumvent. For example, an EAS tag in the form of a pressure sensitive label that is applied to a package exterior is easily removed. Such a label located beneath shrink wrap is visible, and can still be removed, but the removal process is more difficult. Tags hidden beneath the product ID label are generally not visible, and thus are more difficult to detect and remove. Meanwhile, a security tag located inside a package is hidden from view, and therefore less likely to be removed, but such tags are difficult to deactivate for a legitimate sale. Thus there remains a need in the art to provide a reliable EAS tag that would be normally hidden from view in use to protect against detection and removal, but easily deactivated when needed for a legitimate sale. The present invention fulfills that need by combining paperboard and an EAS circuit in such a manner that the EAS circuit is completely hidden in use but readily deactivated when necessary.

### SUMMARY OF THE INVENTION

[0004] The present invention relates generally to the high speed, mass production of EAS security tags, or to packaging which includes an integral security tag. The present invention is carried out by sandwiching RF-EAS

circuits between two layers of paper or paperboard at the same time that product ID's and sales graphics are printed on the paper or paperboard. The specific method or methods for preparing the EAS circuits for use in the present invention are not a part of the present invention. For example, the circuits could be fabricated separately and provided with a pressure sensitive adhesive backing for application to the paper or paperboard in a typical windowing apparatus used to apply windows to envelopes. Alternatively, the EAS circuits could be applied directly to one layer of the paperboard sandwich in the manner disclosed in applicant's pending U.S. patent application S.N. 09/362,614, assigned to the present assignee herein. Other examples of such circuits are disclosed for example in U.S. patents Nos. 3,810,147; 4,583,099; and 5,781,110.

[0005] The advantages of the present invention include economics of cost in producing RF-EAS tags that have hidden circuits, or packaging material with integral RF-EAS tags that are undetectable.

### BRIEF DESCRIPTION OF THE DRAWING

[0006] The Figure of drawing illustrates schematically how the EAS circuit is sandwiched between two layers of paper or paperboard.

### DETAILED DESCRIPTION OF THE INVENTION

[0007] As shown in Figure 1, the EAS ready paperboard product of the present invention comprises an EAS circuit sandwiched between two layers of paperboard. The EAS circuit may be directly stamped/printed on a first sheet of paperboard or adhered thereto as a separate element using pressure sensitive adhesive or the like. Subsequently, the sheet carrying the EAS circuits is laminated or bonded to a second sheet of paper or paperboard so as to sandwich the EAS circuits therebetween using conventional laminating processes known in the art. In the same or a separate operation, the laminated product may be printed with suitable graphics and converted using conventional cutting and folding devices into separate security tags each including an embedded EAS circuit, or into packaging blanks each including an integral EAS circuit.

[0008] The EAS ready paperboard product can be used for any bleached board or kraft board application desired which requires security protection. Examples include food, cigarette and spirits, hardware and automotive, clothing and pharmaceutical packaging and ID's applied to retail items. In its final stage, the converted packaging or security tag/label has the distinction of including the EAS circuit completely hidden, yet susceptible of being deactivated as required.

[0009] Accordingly, while only one method has been fully described herein for making the product of the present invention, it will be obvious to those skilled in the art that other methods and techniques may be used

to carry out the invention substantially as encompassed by the appended claims.

## Claims

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1. A method for producing EAS security tags or packaging blanks with integral EAS security circuits in which such circuits are completely hidden comprising:

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(a) selecting a first sheet of paperboard material having an outer surface and an inner surface;

(b) printing graphics substantially over the outer surface of said first sheet;

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(c) applying to the inner surface of said first sheet a plurality of EAS circuits comprising inductor/capacitor elements tuned to resonate at a specified frequency when exposed to electromagnetic energy;

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(d) bonding a second sheet of paperboard material to the first sheet so as to sandwich the EAS circuits therebetween; and,

(e) converting the bonded sheets of step (d) into separate EAS tags or packaging blanks.

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2. The method of claim 1 wherein the sheets of paperboard comprise bleached board or kraft board.

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3. An EAS security tag comprising an EAS circuit sandwiched between two bonded sheets of paperboard material such that the EAS circuit is completely hidden.

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4. The security tag of claim 3 wherein the sheets of paperboard material comprise bleached board or kraft board.

5. A security tag formed according to the method of claim 1.

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6. A packaging blank formed according to the method of claim 1.

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7. A packaging blank comprising an EAS circuit sandwiched between two bonded sheets of paperboard material such that the EAS circuit is completely hidden.

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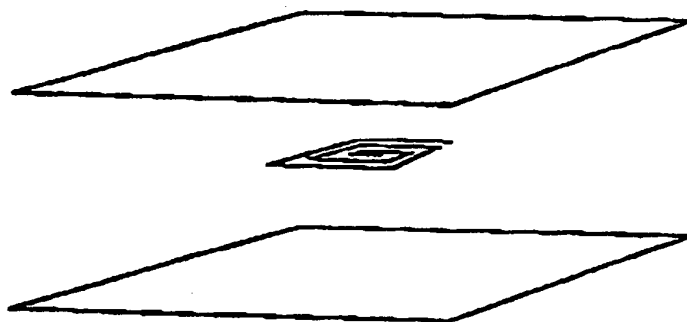


FIG. 1



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## EUROPEAN SEARCH REPORT

Application Number  
EP 01 30 1648

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	GB 2 306 153 A (REXAM CARTONS & PRINT SOUTH LI) 30 April 1997 (1997-04-30) * column 1, line 1 - column 3, line 28; figures *	1-7	B65D5/42
X	US 5 285 191 A (REEB MAX E) 8 February 1994 (1994-02-08) * column 5, line 27 - line 38 * * column 12, line 47 - line 49 * * column 12, line 68 - column 13, line 5 * * column 13, line 26 - line 28 * * claims 11,14; figures 11,12,24A,24B,24C,24D *	3	
X	US 3 913 219 A (LICHTBLAU GEORGE JAY) 21 October 1975 (1975-10-21) * column 7, line 17 - line 21; figures 11,12 *	3	
A		1	
X	EP 0 665 705 A (MIYAKE KK) 2 August 1995 (1995-08-02) * column 10, line 10 - line 25 *	3	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A		1	B65D
A,D	US 6 177 871 B1 (RASBAND PAUL B) 23 January 2001 (2001-01-23) * the whole document *	1,6	
A	WO 00 75038 A (HELLRIEGEL HANS PETER ; CASCADES ARNSBERG GMBH (DE)) 14 December 2000 (2000-12-14) * page 1, paragraphs 2,3 * * column 3, line 35 - column 4, line 8 * * figures 5-7 *	1,6,7	
		-/--	
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 22 August 2001	Examiner Spettel, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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# EUROPEAN SEARCH REPORT

Application Number  
EP 01 30 1648

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 5 574 431 A (MCKEOWN THOMAS J ET AL) 12 November 1996 (1996-11-12) * column 8, line 14 - line 17; figure 7 * -----	3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
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<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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# ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 01 30 1648

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22-08-2001

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2306153	A	30-04-1997	NONE	
US 5285191	A	08-02-1994	DE 3143208 A	19-05-1983
			AT 56554 T	15-09-1990
			DE 3280241 D	18-10-1990
			WO 8301697 A	11-05-1983
			DK 285283 A	21-06-1983
			EP 0092555 A	02-11-1983
			US 4990891 A	05-02-1991
			US 4694283 A	15-09-1987
			US 5291180 A	01-03-1994
US 3913219	A	21-10-1975	CA 1030271 A	25-04-1978
			DE 2523002 A	04-12-1975
			FR 2272571 A	19-12-1975
			GB 1476885 A	16-06-1977
			IT 1032947 B	20-06-1979
			JP 51000657 A	06-01-1976
			JP 56015594 B	10-04-1981
EP 0665705	A	02-08-1995	JP 2899781 B	02-06-1999
			JP 7200954 A	04-08-1995
			US 5645932 A	08-07-1997
			US 6214444 B	10-04-2001
			AU 700075 B	17-12-1998
			AU 2329495 A	06-06-1996
			AU 8786898 A	03-12-1998
			BR 9502961 A	27-05-1997
			CA 2153022 A	02-06-1996
			CN 1126841 A	17-07-1996
			JP 11316882 A	16-11-1999
			JP 3116209 B	11-12-2000
			JP 9044762 A	14-02-1997
			KR 197509 B	15-06-1999
			SG 32369 A	13-08-1996
			SG 71080 A	21-03-2000
			TW 404092 B	01-09-2000
US 6177871	B	23-01-2001	NONE	
WO 0075038	A	14-12-2000	DE 29909681 U	26-08-1999
			AU 4290300 A	28-12-2000
			EP 1109730 A	27-06-2001
US 5574431	A	12-11-1996	AU 707649 B	15-07-1999
			AU 6089296 A	06-03-1997

EPO FORM P0458

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 01 30 1648

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-08-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5574431 A		BR 9603584 A	19-05-1998
		CA 2184135 A	01-03-1997
		CN 1145500 A	19-03-1997
		EP 0762353 A	12-03-1997
		JP 9171597 A	30-06-1997
		NZ 299125 A	27-07-1997
<hr/>			

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82